IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. 10/023,373 Filed December 17, 2001
(Attorney Docket No. GP-301381)

Robert L. Vitale
Kevin g. Kolpasky Group 3618

ELECTRONIC VEHICLE REGISTRATION
AND LICENSE PLATE Examiner Tam D. Tran

AFFIDAVIT UNDER 37 CFR 1.131

Commissioner for Patents
P O Box 1450
Alexandria VA 22313-1450

Robert L. Vital, being duly sworn, deposes and says:

Kevin G. Kolpasky, being duly sworn, deposes and says:

1. I am an inventor of claims 1-21 of the patent application identified above and an inventor of the subject matter described and claimed therein.

2. Prior to October 1, 2001, having earlier conceived of the idea for the claimed invention "Electronic Vehicle Registration And License Plate," and with due diligence, I reduced the invention in the United States as evidenced by the attached invention disclosure form and documentation. The dates have been redacted from the invention disclosure and documentation.

3. That all statements made above of my own knowledge are true, that all statements made above on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under title 18 United States Code, Section 1001 and may jeopardize the validity of the application or any patent issuing thereon.

Robert L. Vitale

Kevin G. Kolpasky

Subscribed and sworn to before me this 7 day of December, ~~2003~~ 2004/03

Sharon A. Borowicz
Notary Public

SHARON A. BOROWICZ
NOTARY PUBLIC, OAKLAND COUNTY, MICHIGAN
MY COMMISSION EXPIRES MAY 15, 2007

General Motors Corporation
Legal Staff
300 Renaissance Center
Mail Code 482-C23-B21
PO Box 300
Detroit MI 48265-3000

Attachment

CONFIDENTIAL AND PRIVILEGED

GENERAL MOTORS CORPORATION

ELECTRICAL File No. GP. 301381

RECORD OF INVENTION

This Record of Invention must be completed with sufficient detail so that your invention can be understood and evaluated by both your engineering management and by a GM Legal Staff patent attorney. Novelty and competitive significance of your invention will be evaluated based on the information you provide.

Invention Title: Digital Vehicle License Plate Display & Digital Registration

Inventor #1

Name: Robert (First Name) L. (Middle Initial) Vitale (Last Name) Citizen of: USA

Social Security No. 374-56-8174 GM Employee: ☒ Yes ☐ No ☒ Salary ☐ Hourly ☐ Contract

Home Address: 46213 Keystone Drive (Street) Macomb Twp., Michigan (City and State) 48044 (Zip Code)

GM Unit: Design Center / APEx / Design & Technology Fusion GM Phone No. (8)-227-2391 (Centrex Number) 810-947-2391 ((Area Code) + Number)

GM Address: 30200 Mound Rd. Mail Code: 480-111-P54 FAX Number: (8)-226-8586 (Centrex Number)

Non-GM Employer: Phone No. ((Area Code) + Number)

Non-GM Employer Address: (Street) (City and State) (Zip Code)

Inventor #2*

Name: Kevin (First Name) G (Middle Initial) Kolpasky (Last Name) Citizen of: United States

Social Security No. 383-80-7320 GM Employee: ☒ Yes ☐ No ☒ Salary ☐ Hourly ☐ Contract

Home Address: 13829 Wellington (Street) Sterling Heights, MI (City and State) 48313 (Zip Code)

GM Unit: Apex/Design and Technology Fusion GM Phone No. (8)-227-1257 (Centrex Number) (810) 947-1257 ((Area Code) + Number)

GM Address: 30200 Mound Road Mail Code: 480-111-P54 FAX Number: (8)-226-8586 (Centrex Number)

Non-GM Employer: Phone No. ((Area Code) + Number)

Non-GM Employer Address: (Street) (City and State) (Zip Code)

* If there are more than two (2) inventors for this invention use the template at the end of this form.

Answer questions 1 - 8, completing all of them to the best of your knowledge.

1. This invention was first thought of on: _____

2. This invention has been or is expected to be disclosed outside GM on: NA

3. This invention has been used or is committed to be used in production on: NA

4. This invention has been offered for sale outside GM on: NA

5. Was this invention made while working on a Government Contract? ☐ Yes ☒ No

   If yes, identify the government Contract No. _____

6. Identify the product or process in which the invention is incorporated: _____

7. List all individuals who can provide information about the making of the invention. This list may include individuals who made the first sketch, description, or tests and individuals who are familiar with the facts relating to the making of the invention.
   Robert Vitale, Kevin Kolpasky

8. Each inventor has a legal duty to disclose all information known that is material to patentability of this invention. Such information includes the relevant prior art, which may be in the form of current or past products, equipment, processes, materials, patents, publications, advertisements, displays, and unpublished developments and proposals—whether originated by you, others in GM, competitors, suppliers, customers or others. Such information also includes disclosure of this invention outside GM, sales and offers of products using this invention, use of this invention in production and disputes about who should be considered as an inventor of this invention. To comply with the duty to disclose, list here and attach a copy of all such information, to the extent known.
   None Known

Answer question 9 thoroughly.

9. Describe the invention in sufficient detail so that its nature, operation and usefulness can be understood.
(Attach drawings, diagrams and further description, when necessary. Additional guidelines are listed below.)
This invention is divided into two parts: The first part is the Display; the second is the Digital registration information storage.

Part One: Digital Display

Current vehicle registration required by each state utilizes a stamped plate with alpha/numeric significance based on a numbering sequence. This plate identifies the state and date of registration as well as other vital information of the vehicle. The invention described herein is designed to provide the same information however in digital form. The digital display eliminates the need for a stamped metal license plates, it replaces it with a moldable digital display adaptable to both rear and/or front bumber fascias with no alteration of the fascia itself. This digital display would be comprised of new LED technology enabling any form of digits (Vehicle Number / Exp. Date) or logos (State ID) to be displayed on its surface. The display can be tied into the main bus (CAN network) via a small connector designed into each fascia either as an aftermarket system or built into the fascia as an OEM system. The signal source can be either small copper wire harness or potentially a fiber optic cable, either way the system would derive its information from the main BCM (Body Computer Module). The display would be visible in daylight lighting condition, also in the northern hemisphere where winter snows can block the ability to read license information, the heat generated from the digital licnese would keep the visual accuity intact. The display would be turned on only when the vehicle is in the running mode, when the vehicle is stopped and turned off so is the display. The local law enforcement could easily read the vehicle information with a handheld scanner off of a bar coded VIN (Vehicle Identifiaction Number) attaced to the body of the vehicle and visible in the lower portion of the IP panel through the windshield. The VIN number would be all that is required to identify the vehicle registration information stored on the secretary of states database. The panel will be designed to be extremely thin, it is inserted into the slot much like a digital camera media card is inserted into the camera.

Part Two: Digital Information Storage

Currently, vehicle owners carry with them a paper copy of the registration information of the vehicle for which they either own or are driving. This invetion would eleiminate the need for this paper form by providing the vehicle registration information be encoded onto a smart chip built into the ignition key (FOB currently in use) or in future application a potential smart card the vehicle driver can carry with them. The VIN plate would also incorporate a smart chip carrying identical inforamtion as the FOB or Smart Card. This would allow access to the vehicle registration information when the vehicle is parked and turned off. This information along with the current usage of transponder information stored on the key would add another level of security supporting anti-theft measures. The registration would always be with the driver of the vehicle eliminating the potential of forgetting to carry it on the person. There are several scenarios on how the key can be coded; first one occurs at the dealership upon delivery of the vehicle to the owner. The second is when the driver renews his or her plates at the local Secretary of State office they encode the key there, only requiring an yearly date update, the vehcicle registration information is only coded once at the dealer or possibly the vehicle factory. The third scenario is the potential to utilize the internet to send the information to the vehicle owner and allow them to code the key at their residence.

Governmental & Community Benefits
State Government would also benefit from this system, a major impact on the infastructure of each state would occur in the reduction and or elimination of the necessity to produce metal license plates for the states residences. This would reduce their overhead and streamline their process.

Mechanical and Electrical Devices: Include illustrations assigning reference numbers to the main elements and refer to the reference numbers in a description that explains how the main elements are connected or related and how they operate.

Electrical Circuits and Controls: Include circuit diagrams and a functional description.

Computer Software and Manufacturing or Business Processes: Include a flowchart or other step-by step overview.

Chemical Inventions: Identify all essential materials used, and alternatives therefor, in chemical terms – not tradenames. Identify and quantify all significant variables (e.g. temperature, pressure, concentration, pH etc.) of the process or material specifying operating ranges and the preferred example. Discuss the significance of each variable. Provide a recipe for at least one working example of the invention.

Answer the following questions if helpful in describing this Invention

10. What benefits will be realized by using this invention?

11. What is the state of development of this invention?

12. To the extent known, what alternatives exist for accomplishing substantially the same result as this invention?

13. Describe the background of the invention. This description may include the state of the prior art and may identify deficiencies in the prior art that are overcome by this invention.

I hereby assign this invention to General Motors Corporation and authorize General Motors Corporation to file an application on my behalf.

Robert L. Vitale	Robert L. Vitale	/ /
INVENTOR – SIGNATURE	**(ALSO, PRINT NAME)**	**DATE**
K Kolpasky	Kevin Kolpasky	
INVENTOR – SIGNATURE	**(ALSO, PRINT NAME)**	**DATE**
INVENTOR – SIGNATURE	**(ALSO, PRINT NAME)**	**DATE**

This invention was reviewed and understood by me:

J Tilk	Jason Tilk	/ /
1st WITNESS – SIGNATURE	**(ALSO PRINT NAME)**	**DATE**
Lisa L Buscher	Lisa L Buscher	
2nd WITNESS – SIGNATURE	**(ALSO, PRINT NAME)**	**DATE**

Digital Vehicle License Plate & Digital Registration

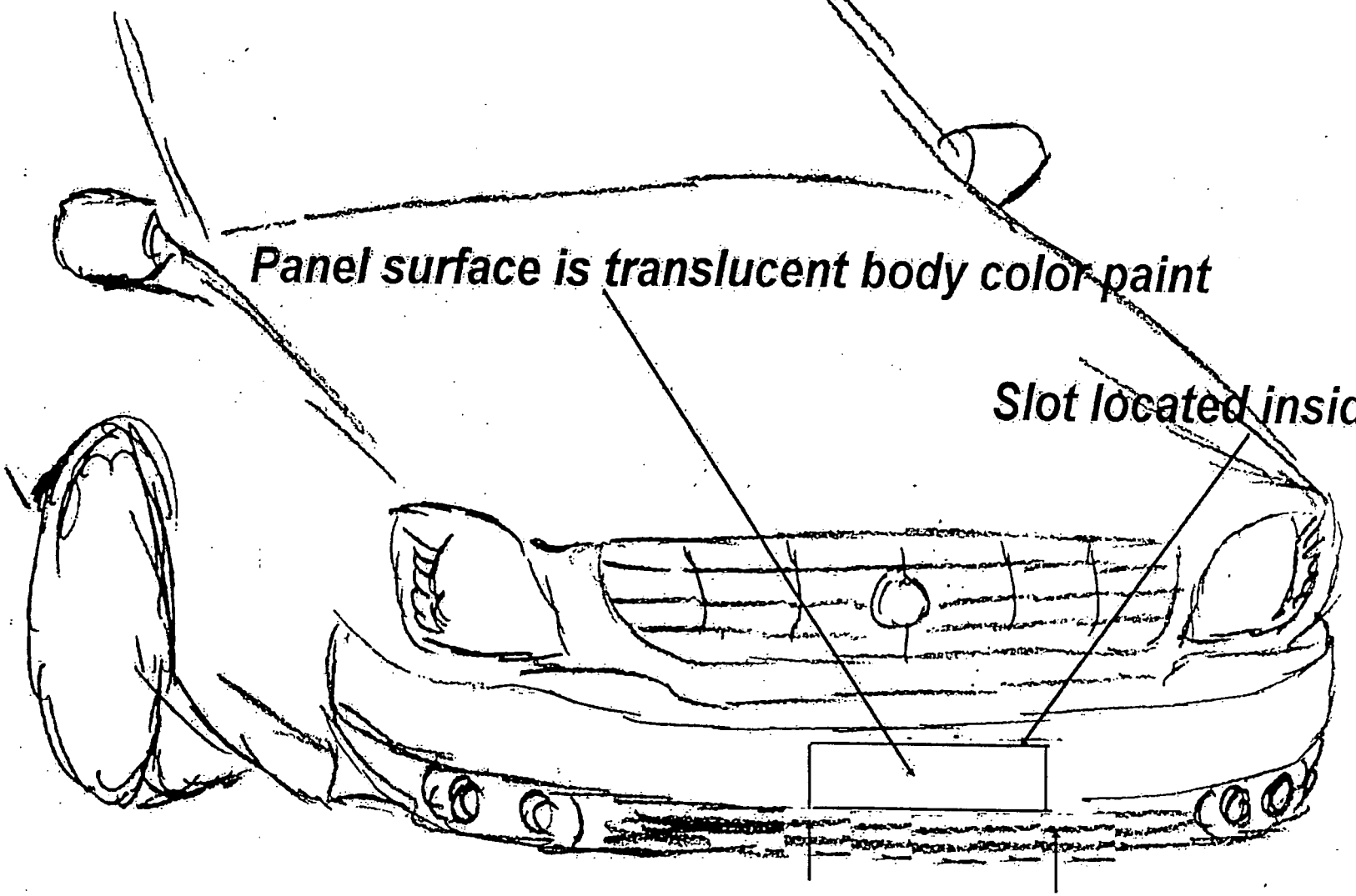
File# GP-GP-301381

Robert Vitale, Kevin G. Kolpasky

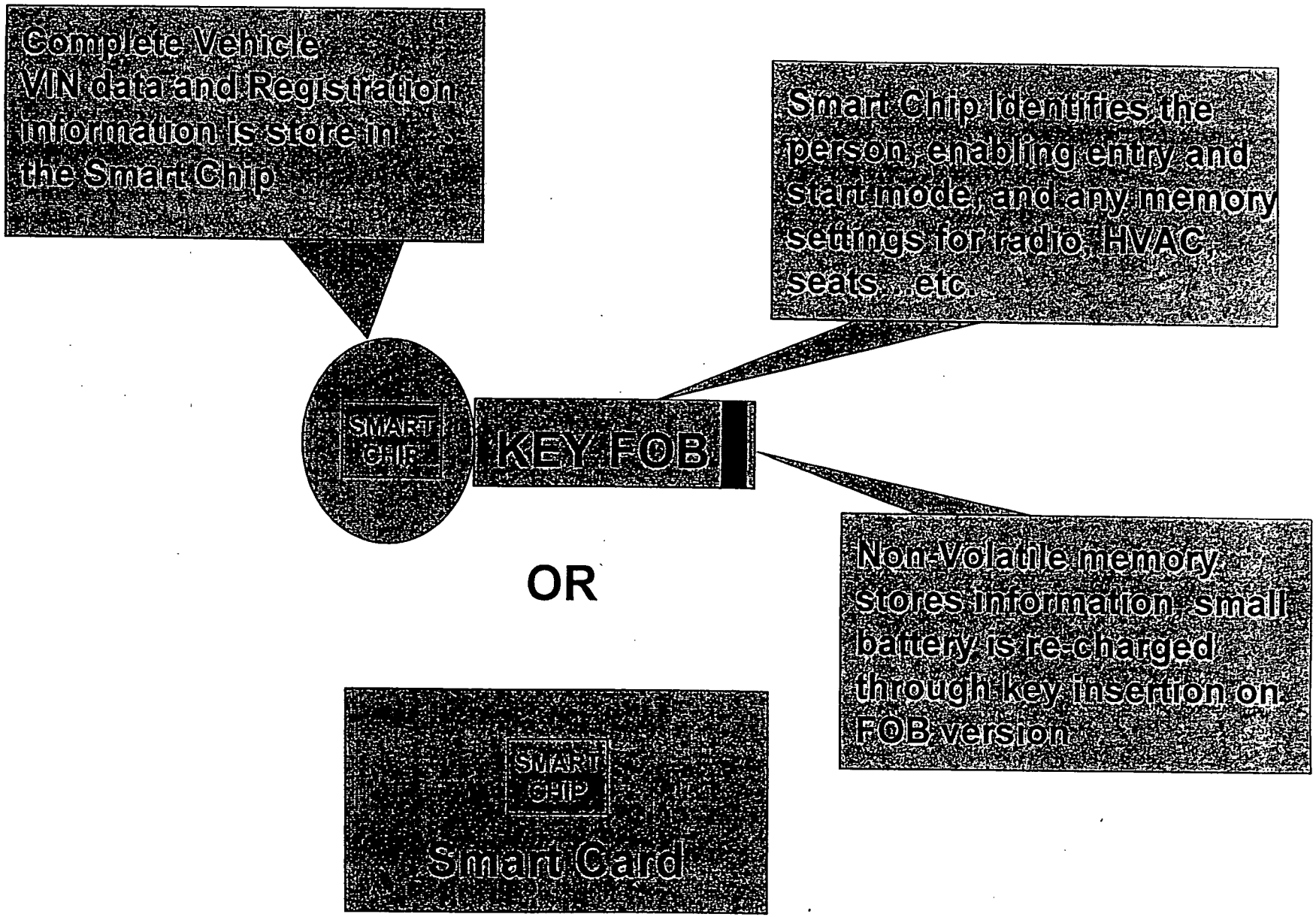
- **D**igital **L**icense **P**late
  - Removes Fascia design constraints
  - Replaces current metal plates with flexible media
  - Replaces stamped information with digital

- **D**igital **V**ehicle **R**egistration / ID
  - On board registration data is stored in BCM
  - BCM communicates with Key FOB/Smart Card
  - Vehicle registration process is brought into the 21st century through digital information delivery
  - Speeds Secretary of State's registration process

The Digital Display allows for either front or rear fascia application

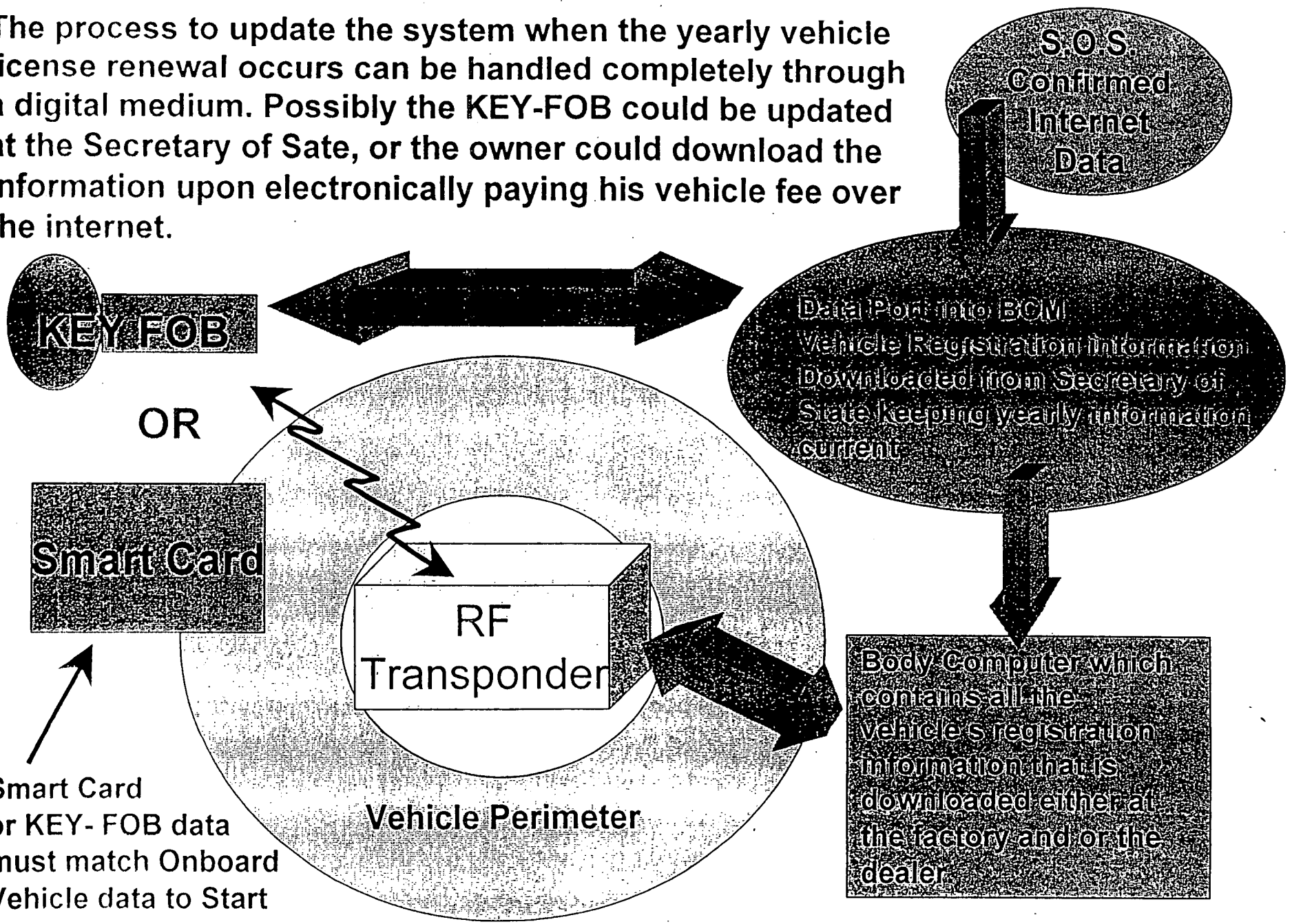


Technology in the CHIP



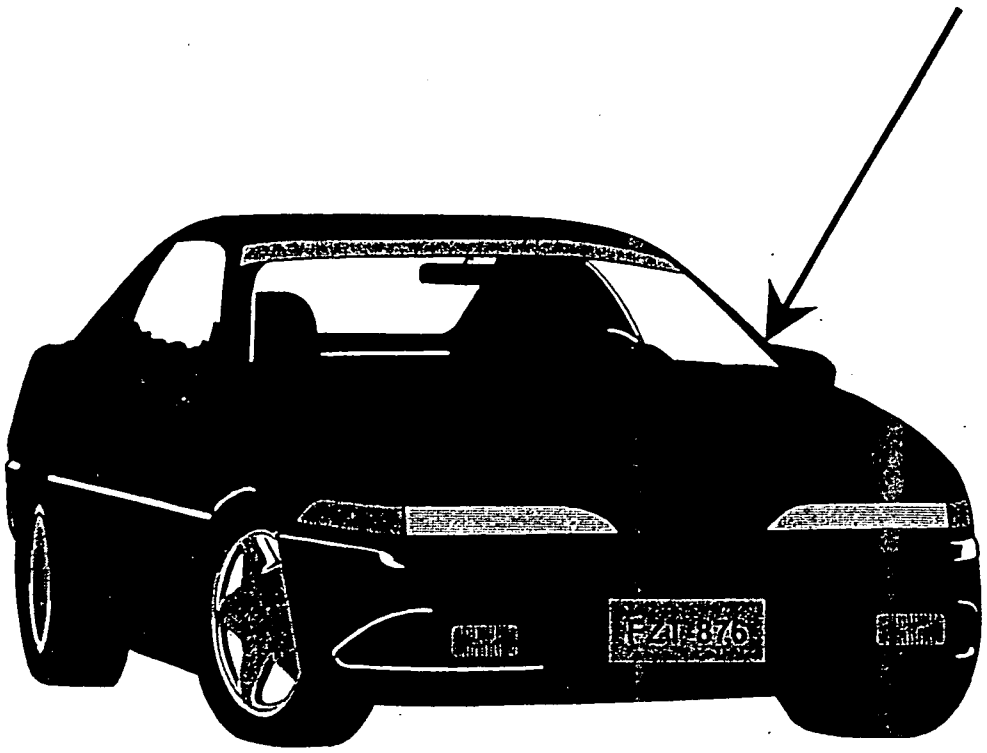
DVR: Digital Vehicle Registration / ID

The process to update the system when the yearly vehicle license renewal occurs can be handled completely through a digital medium. Possibly the KEY-FOB could be updated at the Secretary of Sate, or the owner could download the information upon electronically paying his vehicle fee over the internet.



- When vehicle is parked the Digital Plate is turned off

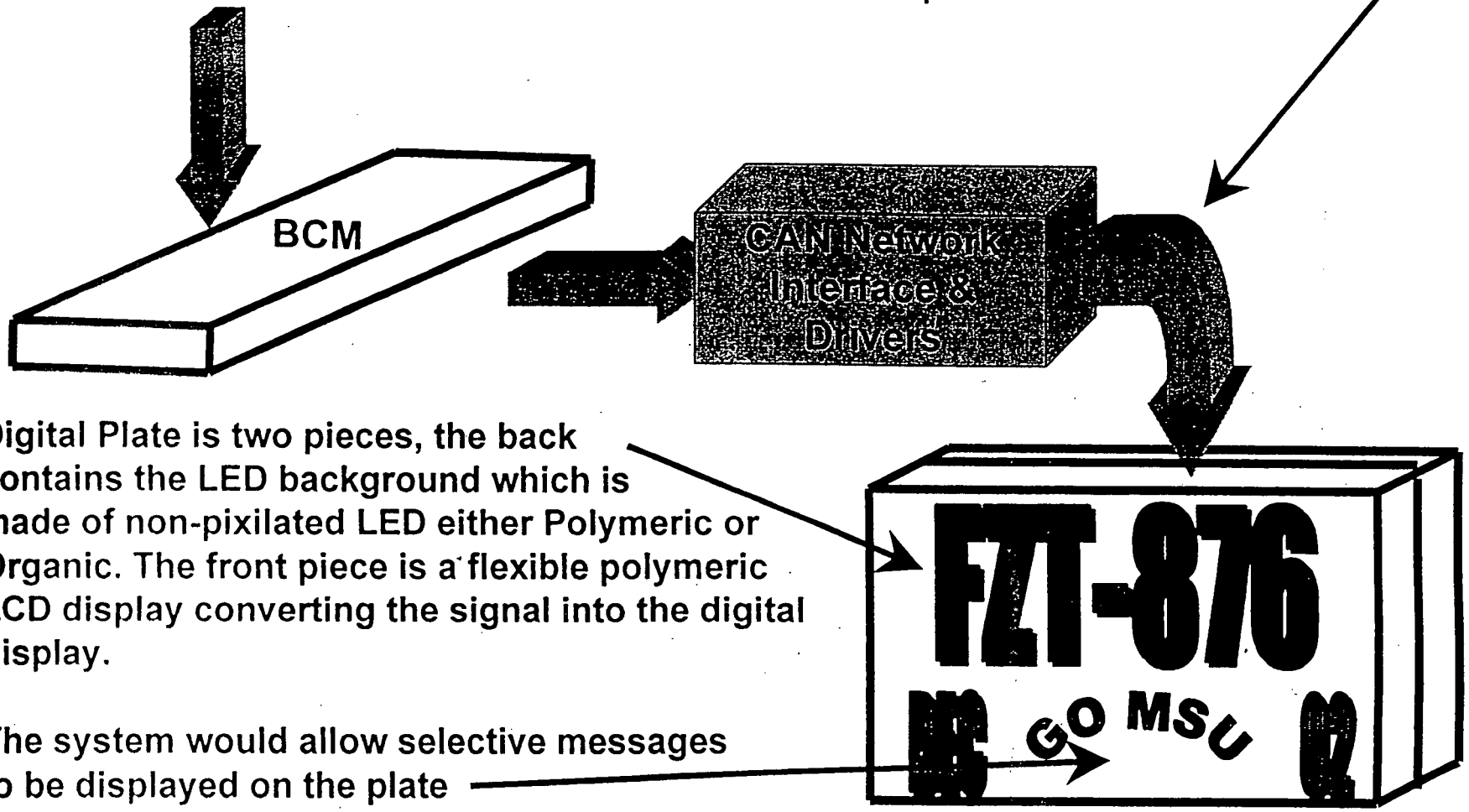
- Law enforcement can ID the vehicle from scanning the VIN tag located on the vehicle, referencing the S.O.S. database can ID the vehicle and its owner



Digital Vehicle License Plate

Vehicle ID Information initiated at Plant Build
Upon delivery the Dealer downloads the S.O.S data when vehicle is first registered
Customer can update on yearly renewal

Network can be flat cable design or potentially Fiber Optic based, cable delivers both signal and power to unit



Digital Plate is two pieces, the back contains the LED background which is made of non-pixilated LED either Polymeric or Organic. The front piece is a flexible polymeric LCD display converting the signal into the digital display.

The system would allow selective messages to be displayed on the plate